

Chapter 5

Specifications

1

General Requirements

1.0 Introduction

These performance-based specifications have been developed to document the materials and fabrication methods for NPS Park Identity Signs.

Great care was given to developing a system that will be durable and, where possible, follow the NPS principles of sustainable design, while being compatible to various park environments.

1.1 Function

These specifications are provided as a guideline for the fabrication, assembly, and installation of Park and Facility signs for the UniGuide Program of the National Park Service. Material and fabrication specifications are provided for each structure and related graphic panels.

All signs are to be built to the specifications described in this chapter. Additional instructions and requirements are to be provided within contracts that describe the performance of specific sign fabricators and suppliers.

1.2 Sign Identification Codes

Each sign type, format, size, assembly, and material is identified by the following planning codes:

Park & Facility Identification Panel Grid Formats: (VIS)

Note: See Volume 3 of the Uniguide Sign Standards for VIS Grids, Fabrication Drawings and Specifications.

VPI-1	VIS–Park Identification Sign with 80/88 text
VPI-2	VIS–Park Identification Sign with 120/132 text
VPI-3	VIS–Park Identification Sign with 160/176 text
VPI-4	VIS–Park Identification Sign with 200/220 text
VFI-1	VIS–Facility/Park Identification Sign with 80/88 text
VFI-2	VIS–Facility/Park Identification with 120/132 text
VFI-3	VIS–Facility/Park Identification with 160/176 text
VFI-4	VIS–Facility/Park Identification with 200/220 text
VFI-5	VIS–Facility Identification Sign with 80/88 text
VFI-6	VIS–Facility Identification Sign with 120/132 text
VFI-7	VIS–Facility Identification Sign with 160/176 text
VFI-8	VIS–Facility Identification Sign with 200/220 text

Park Identification Sign Grid Formats

PI-1GA	Park Identification Sign, 1 Line Ground Mounted with Arrowhead on panel
PI-1GX	Park Identification Sign, 1 Line Ground Mounted with Arrowhead on structure
PI-2GA	Park Identification Sign, 2 Line Ground Mounted with Arrowhead on panel

PI-2GX	Park Identification Sign, 2 Line Ground Mounted with Arrowhead on structure
PI-3GA	Park Identification Sign, 3 Line Ground Mounted with Arrowhead on panel
PI-3GX	Park Identification Sign, 3 Line Ground Mounted with Arrowhead on structure
PI-2HA	Park Identification Sign, 2 Line Hanging Format with Arrowhead on panel
PI-2HX	Park Identification Sign, 2 Line Hanging Format with Arrowhead on structure
PI-3HA	Park Identification Sign, 3 Line Hanging Format with Arrowhead on panel
PI-3HX	Park Identification Sign, 3 Line Hanging Format with Arrowhead on structure
PI-4HA	Park Identification Sign, 4 Line Hanging Format with Arrowhead on panel
PI-4HX	Park Identification Sign, 4 Line Hanging Format with Arrowhead on structure

Facility Identification Sign Grid Formats

FI-1G	Facility Identification Sign, 1 Line Ground Mounted Sign Format
FI-2G	Facility Identification Sign, 2 Line Ground Mounted Sign Format
FI-3G	Facility Identification Sign, 3 Line Ground Mounted Sign Format
FI-1H	Facility Identification Sign, 1 Line Hanging Sign Format
FI-2H	Facility Identification Sign, 2 Line Hanging Sign Format
FI-3H	Facility Identification Sign, 3 Line Hanging Sign Format
F/PI-1G	Facility/Park Identification Sign, 1 Line Ground Mounted Sign Format
F/PI-1H	Facility/Park Identification Sign, 1 Line Hanging Sign Format
F/PI-2G	Facility/Park Identification Sign, 2 Line Ground Mounted Sign Format
F/PI-2H	Facility/Park Identification Sign, 2 Line Hanging Sign Format
F/PI-3G	Facility/Park Identification Sign, 3 Line Ground Mounted Sign Format
F/PI-3H	Facility/Park Identification Sign, 3 Line Hanging Sign Format

1.3 Installation Sticker

All finished sign panels shall be provided with a 1-1/4" x 2-1/2" weather resistant identification placed on the back of the sign indicating sign plan ID number, manufacturer, date of fabrication, and installation date.

1.4 Reference Standards

- California Redwood Association grading rules for Dimensional Redwood lumber including Clear Heart, kiln-dried vertical grain redwood, and Construction Heart redwood
- Western Red Cedar Lumber Association Number 1, Select, and No. 1 Structural Select Lumber using the grading rules of the National Lumber Grading Authority as approved by the American Lumber Standards Board of Review
- American Society for Testing and Materials, and American Institute for Hollow Structural Sections standards (HSS) for ASTM-A500B; Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- American Society for Testing and Materials, and American Institute for steel plate, bar stock, and rolled sections; Standard Specification for A-36 material

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- Western Wood Products Association Design Pressure Treated Lumber
 - American Society for Testing and Materials standard specification for aluminum alloy plate and aluminum extruded sections (ASTM- 6061-T6)

1.5 Graphic Standards

All graphic formats, use of typography, color, directional arrow graphics, pictograms and NPS Arrowhead logo shall comply without deviation from the Graphic Standards illustrated in Chapter 2. All exceptions must be approved in writing by the NPS UniGuide Program Manager based on a graphic submission submitted for review.

1.6 Structural Engineering

All structures have been engineered to meet typical conditions for all national parks. Special conditions that are outside these parameters are to be engineered on a site specific basis.

1.7 Quality of Materials

All materials shall be new and of first quality. Materials shall meet or exceed the standards and specifications herein or by reference. Factory seconds shall not be accepted. All materials shall comply with this specification or approved equal.

2

UniGuide Engineering

2.0 Engineering Criteria

The following criteria have been used as the standards governing material specifications, assemblies and footings for all recreation project signs unless otherwise specified.

Wind Pressure	20 PSF ***
Soil	1-TSF (2 KSF)-Minimum ***
Frost Depth	36" Maximum unless otherwise noted
Concrete:	3000 PSI. / 28 days

* For all direct embedment footings, backfill in 6" lifts tamped to 95% compaction.

** Subgrade materials are assumed to be organic free sand/gravel/silt, or mixture of same, with bearing capacity of 1-TSF (2 KSF) min, subject to inspection.

*** Exceptions include sign placements along the Gulf of Mexico and in the region of Cape Hattaras, with installations engineered site specific to the location.

If these criteria are not adequate for a specific sign location, modifications shall be made to conform to the basic assembly specifications of specified sign type. Modifications may include, but are not limited to, thicker panels, larger dimension sign posts or larger footing configuration.

The design of the structural requirements of special one-of-a-kind signs shall conform to the basic assembly specifications for similar sign types. The modified assembly shall fulfill the requirements of local criteria for wind pressure, soil, and frost depth.

3

Installation

3.0 introduction

Installation may include assembly and installation only, or assembly, installation and removal and disposal of existing signs.

3.1 Workscope

Contractor shall furnish all labor, materials, tools, equipment, loading/unloading and transportation services required to perform and complete the work according to the specifications and contract documents. All work shall be done with no damage to mounting site or sign.

3.2 Staging Area

If requested, the NPS will provide a lay-down and staging location for sign assembly and sign component storage during the installation process. Location will be in close proximity to the construction site but outside of areas that are actively used by park visitors. Contractor shall stay within designated area and not damage surrounding vegetation. Upon completion of installation project, Contractor shall remove all materials and restore area to preexisting condition. Securing the area will be the responsibility of the Contractor.

3.3 Footings Reference

For complete specifications on foundations and assembly, refer to Chapters 4 and 5 of this volume.

3.4 Sign Location

All signs are to be mounted at locations as identified in the sign plan and approval by the COTR specified in the task order. Sign locations on site should be marked with a stake. The stake should have the sign type code, and location code, and correspond to the sign location plan drawings.

3.5 Field Verification

The Contractor shall check and verify all dimensions and conditions at the job site prior to installation. Discrepancies are to be brought to the attention of the COTR for adjudication and resolution.

3.6 Survey

All survey and land data will be provided by the NPS and are not the responsibility of the contractor unless otherwise specified.

3.7 Sign Engineering

All sign engineering will be the responsibility of the contractor unless otherwise noted in contract documents.

3.8 Obstructions

Unforeseen obstructions may limit the depth of a standard footing or require special mitigation to prevent damage to existing tree roots. Where possible, move the sign as needed to allow unconstrained subsurface installation. If a sign placement location must be moved because of subsurface obstructions, the Contractor shall notify the COTR specified in the task order if such installation will not fit in this location. If the sign can be logically moved, verify sight-lines of adjusted locations to affirm that sign is still visible from the designated approach.

- If plant and tree obstructions are identified, and the sign location cannot be moved, follow the instructions below for Tree/Plant Protection, and Mitigation of Damage.
- If the sign location cannot be moved and nonplant (rock) obstructions prohibit the footing from being as deep as specified, see respective “Shallow Footing” specification in the Uniguide Field Manual.

The COTR specified in the task order will provide known existing condition data on utility line locations in conjunction with park engineering and maintenance operations and utility company surveys. Prior to beginning excavation, the Contractor shall notify Contract Officer and utility companies of proposed sign locations and times for excavation.

The Contractor shall be responsible for locating and preventing damage to known utilities. If damage occurs, the Contractor shall repair the utility at no additional expense to the Government.

3.9 Site Protection

The Contractor shall provide all necessary protection for his work until turned over to the COTR. The Contractor shall protect all adjacent structures, surfaces, vegetation and plant materials from damage during installation. The Contractor will notify the COTR specified in task order of any damage immediately of occurrence. Any damage to the items described above must be restored to original condition and appearance, or replaced.

Confine all operations to work limits of the project. Prevent damage to natural surroundings. Restore damaged areas, repairing or replacing damaged trees and plants at no additional cost to the Government.

- Do not remove, injure, or destroy trees or other plants. Consult with COTR to remove agreed-on roots and branches, or whole branches or trees that interfere with sign installation.
- Do not fasten ropes, cables, or guys to existing trees.
- Carefully supervise excavating, grading, filling, and other construction operations near trees to prevent damage.

Minimize disturbance to tree trunks and root zones to prevent damage to trees.

- Do not drive over root zones unless work cannot otherwise reasonably be done. Driving over roots will compact the soil and can harm or destroy the tree.
- Do not pile excavated soil against tree trunks.
- Do not compact soil around roots to a greater degree than surrounding unexcavated soil except to meet compaction requirements for backfilling signpost installations.

3.10 Tree/Plant Protection

Do not remove, injure, or destroy trees, tree roots, or other plants without prior approval. Use accepted horticultural practices for all work. Adjust sign installation locations to keep them beyond the drip line wherever possible. Notify the COTR of the specified task order of any proposed sign locations within the drip line of the trees. The drip line shall be defined as the area below the farthest-spreading branches of a tree. Where such adjustments are not practical, maintain the following minimum clearances between the face of trees to be saved and the closest edge of sign footing:

- for trees more than 30' in diameter allow 10 feet
- for trees between 15' and 30' in diameter allow 8 feet
- for trees less than 15' in diameter allow 5 feet

3.11 Mitigation of Damage

Take steps to mitigate damage to roots wherever excavation must take place within the drip line of trees and wherever excavation must take place within the drip line of other trees 12 inches or larger in diameter:

- Excavate carefully where tree roots might be encountered. Where roots 2" and larger are encountered, hand excavate as required to prevent damage to roots. Tunnel under roots to be saved, hand excavating as necessary
- Do not cut roots over 2" in diameter

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- Cleanly saw cut roots between 1” and 2 “ in diameter where they interface with work; do not cut roots except as necessary. Roots between 1” and 2” in diameter which must be cut shall be cleanly saw cut near the edge of sign foundation closest to the tree to prevent roots from being dislodged from soil by equipment.
 - Within four hours of excavating wrap burlap around the ends of cut roots larger than 1’ in diameter and wet the burlap. Keep the burlap moist until the sign is backfilled. During backfilling operations, bring the burlap to within a few inches of the ground surface.
 - Thoroughly wet roots and burlap in the excavated area before backfilling. Backfill shall contain as much water as is compatible with compaction.

3.12 Archeological Findings

Petroglyphs, artifacts, burial grounds or remains, structural features, ceremonial, domestic, and archeological objects of any nature, historic or prehistoric, found within the construction area are the property of and will be removed only by the Government.

3.13 Demolition

Sign to be replaced shall be removed completely by the Contractor following or in conjunction with installation of the new signs unless otherwise specified.

All designated existing signage and related structures shall be removed from the project area and disposed of properly in accordance with state and local regulations unless otherwise indicated.

3.14 Installation Quality

The Contractor shall install all signs level and plumb at the specified heights and alignments with all specified footings, backfill, or attachment hardware.

The Contractor shall remove all packing, sign boxes, and construction materials from the project upon completion of installation.

The Contractor shall replace damaged ground cover with same species as damaged in the installation process unless instructed otherwise in the installation specifications provided by the park.

4

Materials Overview

4.0 Introduction

These specifications apply to the furnishing of park and place Identification Signs with routed wood faces. Mounting formats include:

- Double post sign with interior steel upright and wood frame, with wood panel and leg cover
- Double post sign with interior steel upright and frame, with wood panel and leg cover
- Monolith sign with formed concrete base, interior steel uprights and wood panel and frame cover
- Monolith sign with formed concrete base with stone or brick face, interior steel uprights and wood panel and frame cover
- Wall mounted sign cleat mounted to masonry or wood building facade
- Single post timber upright with flag mounted sign

4.1 General Requirements

Signs and sign assemblies are to be manufactured using materials and fabrication processes as described in this specification and in companion drawings, and match quality of initial submissions.

4.2 Dimensions

Dimensions specified in inches include: legend size and all related dimensions for layout grids, panel sizes, post lengths, mounting height, post drilling for connection of panel to post, and all hardware, machine parts (brackets, mechanical fasteners, frames), materials (tube, dimensional lumber).

4.3 Structural Engineering

All structures have been engineered to meet typical conditions throughout the National Park System. Special conditions outside these parameters are to be engineered on a site-specific basis.

5

Wood

5.0 introduction

This specification allows use of redwood or Western Red Cedar. The National Park Service prefers use of cedar based on overall cost and principles of sustainability. If one material is used, it must be used consistently throughout a type of sign. Components of a frame, panel, or leg shall use only one material of the same grade throughout.

5.1 Western Red Cedar and Redwood Dimensional Lumber

Laminated clear heart, kiln-dried vertical grain redwood or Western Red Cedar with maximum moisture content of 12%, for panels, fabricated posts and monolith edge. Redwood to be selected per grading rules of the California Redwood Association or better for panels, frames, and posts. Cedar to be selected per grading rules of the Western Red Cedar Lumber Association using the grading rules of the National Lumber Grading Authority as approved by the American Lumber Standards Board of Review.

Applications include:

- 1-1/2" thick sign panels
- 2" lumber (nominal, 1-1/2" finished) lumber with varying widths for: finished top cap of monolith and double post assembly, side cover on monolith, leg cover and cap assembly for double post sign, inboard post blocking double post sign, and fascia boards on single post flag mounted assembly
- 2" lumber fascia for cross member of flag mounted single post assembly

5.2 Western Red Cedar and Redwood Timber

Full dimension construction heart redwood to be selected per grading rules of the California Redwood Association or better for redwood lumber frames and solid posts. Number 1, select structural per grading rules of the Western Red Cedar Lumber Association using the grading rules of the National Lumber Grading Authority as approved by the American Lumber Standards Board of Review.

Applications include 8" x 8", 10" x 10", 12" x 12", timbers for upright timber and cross member of flag mounted single post assembly.

5.3 Cedar

Milled plugs for counter sunk

- 1-1/2 diameter x 1" Wood Plug for to cover countersunk tenon joint of hanging panel
- 2" diameter x 1" Wood Plug for to cover countersunk bolt supporting steel bracket of hanging panel

5.4 Douglas Fir

Dimensional lumber, kiln-dried, to be selected using the grading rules of the Western Wood Products Association.

5.5 Douglas Fir (Pressure Treated)

Structural Grade, Number 2 Standard and Better pressure-treated with ACQ (Ammoniacal Copper Quat.). Do not use CCA treated material.

Applications include 2" (width varies) blocking on inside and outside of wood posts, and rails for double post assembly and alignment cross member on monolithic structures.

5.6 Douglas Fir Timbers

Select Structural Grade, Number 1 and Better.

Applications include (alternate, not a substitute to Cedar) 8" x 8", 10" x 10", 12" x 12", timbers for upright timber and cross member of flag mounted single post assembly.

5.7 Plywood

5/8" and 3/4" thick Marine Grade A-C or better plywood material per the grading rules of the American Plywood Association. Plywood used for mounting bolt templates.

1/2" thick pressure-treated material per the grading rules of the American Plywood Association. Plywood used for center blocking in wood rails.

6

Steel

6.0 Introduction

This section covers specifications for all steel component assemblies used in the UniGuide Park Identity system.

6.1 Double Post Assemblies

Tubular sections: A-36 tubular steel hot-dipped galvanized after fabrication.

- 3-1/2" x 3-1/2" x 3/16", 6" x 4" x 1/4", 8" x 6" x 1/4", 8" x 6" x 5/16" for interior posts of double post assemblies
- 6" x 6" x 1/4" and 6" x 8" x 3/16" for tubular steel rails
- Structural angle: A-36 steel, 3-1/2" x 5" x 5/16" for attachment of wood rails to steel posts
- A-36 steel plate for baseplates: 7" x 7" x 1/2", 9" x 11" x 5/8", and 12" x 14" x 3/4"
- 1/2" A-36 steel plate for threaded end plug of steel rail
- 1" x 6.5" x 1/16" stainless steel strap with 3-3/16" holes to secure panels on double post assemblies
- 1" x 1/16" stainless steel panel retention strap (length varies by thickness of assembly)

6.2 Monolithic Assemblies

- 6" x 4" x 1/4" tubular sections: A-36 tubular steel with hot-dipped galvanized coating after fabrication for interior posts of monolithic assemblies
- 2" x 2" x 1/4" x 6" long structural angle: A-36 steel, for attachment of wood cap blocking to top of monolith steel posts
- Plate: A-36 steel for baseplates: 8-1/2" x 9" x 5/8"

A-615 grade 60, reinforcing bar with epoxy coating

- Straight, varying length A-615 grade 60, #4, reinforcing bar for bottom of pier, sub-base and monolith
- 18" long, A-615 grade 60, #4, bent reinforcing bar: with 6" returns each end
- 24' long, A-615 grade 60, #4, bent reinforcing bar: with 8" returns each end
- 5/8" dia. A-36 galvanized anchor bolts, 22" long with 6" returns

6.3 Single Post Hanging Assembly

- 1/2" x 4" A-36 grade steel bar for cross member bracket, hot-dipped galvanized
- 14" x 14" x 5/8", and 16" x 16" x 5/8" A36 steel plate for baseplates
- 1/2" x 3-1/2" x 36" and 1/2" x 4" x 42 " A36 steel straps for baseplates
- 5/8" dia. A-36 galvanized anchor bolts, 18" long with 6" returns

7

Hardware

7.0 Introduction

This section covers hardware assembly specifications for components used in the UniGuide Park Identity system.

7.1 Panel Attachment

- 4" x 2" x 3/16" (6061-T6) aluminum plate for machined keyhole bracket
- No.12 Phillips x 1" stainless steel screws to attach keyhole panel to back of sign panel (MC90294A296)
- 1-1/8" x 11/16" custom aluminum (6061-T6) machined hex head capture nut
- 3/8"-16 stainless steel threaded rod with machined hex head capture nut with locktite on one end (4-5/8" for wood rail, 7-1/4" for 6" x 6" steel rail, 9-1/4" for 6" x 8" rail)
- 3/8"-16 x 3/4" flathead stainless steel machine screw for attachment of custom-machined hex head capture nut to aluminum plate for wall-mounted signs (MC91500A622)
- 2-1/2", No.12 stainless steel, flat Phillips head screws for attachment of panel edge strips on laminated sign panel (MC-90294A296)

7.2 Double Post Assemblies (wood rail)

- 3/8"-16 X 5-1/4" custom stainless steel threaded rod with welded nut on end with stainless steel flat washers and stainless steel hex nut to secure outboard blocking to steel leg
- 3/8"-16 X 6-1/8" custom stainless steel threaded rod welded nut on one end with flat washers and hex nut to secure inboard and inboard blocking to steel leg
- No.8 x 2-1/2" galvanized deck screws to attach top cap, and post cover to frame (MC90031A207)
- 3/8"-16 X 3-1/2" flathead, stainless steel machine screw to attach wood rail to steel angle on upright (MC91771A638)
- 1/2" dia. stainless steel anchor bolts, 14" long with 4" returns (MC91603A165), with stainless steel hex nut, jam nut, washer and leveling nuts

7.3 Double Post Assemblies (steel rail)

- 3/8"-16 x 10" & 12" stainless steel threaded rod (custom bolt) to attach upper wood blocking to steel leg
- 3/8"-16 x 8" & 10" stainless steel threaded rod (custom bolt) to attach lower wood blocking to steel leg
- 1/2"-13 x 1-1/2" stainless steel hex head cap screw to attach steel rail to steel upright (MC92240A715)
- Stainless steel spring (lock) washer to attach steel rail to steel upright (MC91104A033)
- Stainless steel flat washer O.D.=1-1/16" I.D.= 17/32" to attach steel rail to steel upright (MC98019A509)

- #12 x 3" galvanized wood screws to attach wood leg and cap to wood interior blocking (MC#90095A133)
- Stainless steel flat washer O.D.=1" I.D.=9/32" to mount top cedar cap (MC90313A107)
- 1/4" stainless steel countersunk washer to hold top cedar cap (MC98466A029)
- 1/4"-20 x 2" stainless steel flat head machine screw to mount top cedar cap (MC# 91500A550)
- Bulletin AEK Spintite™ Rib-Wall Minimized-Profile Head Rivet inserted in top rail to receive 1/4"-20 top cap screw
- 5/8"-11 dia. A-36 galvanized anchor bolts, 17-1/4" long with 6" returns (MC91603A265), with hex nut, jam nut, washers top and bottom and leveling nut
- 3/4"-10 dia. A-36 galvanized anchor bolts, 23-1/4" long with 8" returns (MC91603A325), with hex nut, jam nut, washers top and bottom and leveling nut

7.4 Monolithic Assemblies

- 1", No.12 stainless steel flathead wood screws for attachment of keyhole plate to panel back (MC 90294A296)
- 1/4"-20 Bulletin AEK Spintite™ Rib-wall minimized-profile head rivet to attach alignment blocking and outboard blocking on to steel angle and post sides
- 1/4"-20 x 2" stainless steel, flathead machine screw (MC 91500A550)
- 1/4" countersunk washer to seat screw (MC98466A029)
- Flat washer, I.D.= 9/32", O.D.=1.00", 0.047" thick (91090A108)
- 5/8" stainless steel hex nut to level and secure baseplate and post assembly to J-bolts (MC94895A035)
- 5/8" Stainless steel acorn nut to keep secure and finish baseplate connection (MC91855A035)
- 3/8"-16 x 7-1/4" threaded stainless steel rod with custom hex nut (spanner nut).
- 2-1/4" zinc-plated steel deck screws for attachment of cedar panel cap and end caps (MC90031A254)
- 3", No.12 Phillips zinc-plated steel, flathead screws for attachment of panel edge strips (MC90031A305)
- 0.375" x 6" Zinc-plated lag screws to attach wood frame to sign posts
- 5/8"-11 dia. A-36 galvanized anchor bolts, 17-1/4" long with 6" returns (MC91603A265), with hex nut, jam nut, washers top and bottom and leveling nut

7.5 Wall-Mounted Assemblies

- 3/8"-16 threaded rod (6" sections) for wall-mounted anchorage
- 3/8" 16 hex heavy 18-8 stainless steel Thin (Jam) Nuts for wall mount anchorage (MC 91851A630)
- 13/32" x 1-1/4" od, 18-8 stainless steel large OD flat washers for wall mount anchorage (MC 90313A114)

7.6 Single Post Hanging Assembly

- 5/8"-11 X 7" eye bolt fabricated internal to sign panel for hanging (MC9489A148)
- 5/8"-11 X 10" J-bolt for capture of eye bolt to suspend sign (MC91604A320), (12"-MC91604A330)
- 5/8" flat washers to secure J-bolt on cross member (MC98970A135)
- 5/8"-11 X 9" hex head cap screw to secure bracket to 9-1/2" upright (MC91247A461)
- 5/8"-11 X 11" hex head cap screw to secure bracket to 11-1/2" upright (MC91236A827)
- 5/8"-11 hex nut to secure bracket on upright timber (MC94895A035)
- 1-1/2" X 2" X 1/2" with 5/8-11 thread inset into panel assembly (custom oversize washer)
- No. 8-3" galvanized deck screw to attach fascia panel (MC95616A209)
- 1/2"-13 X 8" hex head cap screw to secure tenon (MC91247A742)
- 1/2"-13 X 10" hex head cap screw to secure tenon (MC91247A746)
- 1/2"-13 hex nut to secure tenon (MC94895A823)
- 1/2" flatwashers to secure tenon (MC98970A133)
- 5/8"-11 X 10" 18-8 stainless steel hex head bolt to attach baseplate to upright post for 9-1/2" x 9-1/2" post (92198A826)
- 5/8"-11 X 12" 18-8 stainless steel hex head bolt to attach baseplate to upright post for 11-1/2" x 11-1/2" post (92198A830)
- 5/8"-11 dia. A-36 galvanized anchor bolts, 17-1/4" long with 6" returns (MC91603A265), with hex nut, jam nut, washers top and bottom and leveling nut

7.7 Aluminum

1/4" x 3" x variable length 6061-T6 Aluminum plate for wall mount attachment plate

7.8 Stone

- Random coursed ashlar stone
- Uncoursed field stone
- Granite block sections of standard grade Sierra White Granite, free of cracks, seams, or starts which may impair structural integrity or function

7.9 Adhesive

- Phenolic resorcinol moisture resistant adhesive for fabrication of panels and posts
- HILTI-HVA catalytic anchor system for attaching anchor bolts to stone or concrete surfaces
- HILTI-HIT HY20 System Adhesive Anchors for attaching anchor bolts to brick surfaces

7.10 Paints/Finishes

7.10.1 Primer

Benjamin Moore, Exterior Fast Drying Exterior alkyd primer, No. 09400 or equal

7.9.2 Finish enamel for letter fill

Benjamin Moore, Impervex latex exterior enamel No. 309-2B, or equal, Color: Off-white (2B-2143-50 Old Prairie) with double coat of primer

7.10.3 Solid color stain for sign panel overbar

Benjamin Moore Acrylic Latex Solid Stain (No. 089-4B), Color: River Rock-2139-10)

7.10.4 Solid color stain for sign panel, cap and ends of monolith

Benjamin Moore Acrylic Latex Solid Stain (No. 089-4B), Color: Grey-Brown-5/E 1000

7.10.5 Solid color stain for sign uprights, and sign post for single post assembly

Benjamin Moore Acrylic Latex Solid Stain (No. 089-4B), Color: Dark Brown-2130-10)

7.10.6 Enamel (alternate) for sign panel overbar

Benjamin Moore Acrylic Moorglo Enamel (No. 096-4B), Color: River Rock-2139-10)

7.10.7 Enamel (alternate) for sign panel, cap and ends of monolith

Benjamin Moore Acrylic Moorglo Enamel (No.096-4B), Color: Grey-Brown-5/E 1000

7.10.8 Enamel (alternate) for sign uprights, and sign post for single post assembly

Benjamin Moore Acrylic Moorglo Enamel (No.096-4B), Color: Dark Brown-2130-10

7.11 Porcelain Enamel

16 gauge enameling steel panel (ASTM-424) Type I with sealed bead edge porcelain enamel with 2-color, laser cut NPS Arrowhead Logo with 1/8"ø x 1-1/4" mounting studs on back of panel

7.12 Coatings Hardware

Standard bituminous roofing cement for embedded posts

7.13 Concrete

- 3000 lbs./28 days
- All cast-in-place concrete work shall follow National Park Service specifications for material and construction procedures, Section 03300
- All mortar and masonry grout work shall follow National Park Service specifications for material and construction procedures, Section 04100

7.14 Polyethylene

8 mil sheet for base of footings

7.15 Marine Grade Polymer Sheet

1" thick, King StarBoard marine grade polymer sheet, color: seafoam, for backing of porcelain enamel arrowheads mounted to masonry structures

8

Sign Size, Base, and Footing Fabrication

8.0 Introduction

Each assembly size has been custom-engineered based on the size of the sign, the format of the legend, the length of the longest legend line, the height of the panel based on the specified grid format, and the height of the structure above grade. Many variables including the length of the steel posts, size and thickness of the baseplate, the section size of the rail, and diameter, length of the anchor bolts, and size of the footing are unique to each configuration.

Dimension charts are provided for double post signs and signs with monolithic bases. These spreadsheets are displayed based on the size of the primary legend, and include 4", 6", 9", and 12". The larger 9" assemblies limit some layouts including three-line primary legends, and signs with 12" primary legends are limited to two lines for Park Identification (PI-1G and PI-2G only). The fabrication of all primary sign components and footings and bases shall be based on the sizes specified in these charts.

The charts are provided at the end of each respective part of the fabrication drawings.

8.1 Tubular Steel Uprights and Rails

8.1.1 Double Post

All signs have internal steel upright posts with welded baseplates. Post and rail size is different depending on size of sign. Assemblies with wood rails include a steel angle welded to the inboard face of a 3-1/2" x 3-1/2" x 3/16" tubular A500B steel post for rail attachment. Assemblies with steel rails are drilled for bolt attachment of rail and are fabricated from 6" x 4" x 1/4", 8" x 6" x 1/4", 8" x 6" x 5/16" tubular A500B steel posts with size of post based on height and size of sign panel. Both types of uprights are drilled to accommodate the bolt attachment of blocking and face panels to steel post. All baseplates and rolled sections (angles and plate) to be A-36 steel.

Steel rails are tubular sections with inserted welded steel plates that are drilled and tapped for attachment to steel uprights.

8.1.2 Monoliths

All monoliths utilize 6" x 4" x 1/4" tubular sections for uprights with welded baseplate. A clip angle is welded at the top of the post for attachment of post alignment board. The length of the upright is based on height of sign panel. Larger assemblies will require as many as six uprights.

8.2 General Requirements

The length and dimension of parts, size of end plates, and drilling tolerance for hole location on both axis to be no more than $\pm 1/16"$. Parts are measured from center of the holes to the edge of the plate.

Baseplate and angle attachment, and rail attachment plate assemblies to be fabricated with full penetration weld using welding rod compatible with the baseplate and tube assembly.

Finished weld to be cleaned to remove all welding slag and weld splatter.

All posts to be cut square. Finish to be free of edge burrs. Fabricated posts to be degreased and sandblasted with copper slag abrasive to create an even finish throughout.

All fabricated steel upright posts and fabricated steel rails shall be hot-dip galvanized after fabrication.

8.3 Steel Post Fabrication for Double Post Signs with Wood Rail

8.3.1 Length

Length of interior tubular steel upright is determined by the height of the sign panel based on the size of the primary legend, 4", and 6". Refer to "Steel Post Height" in the Double Post Assembly Dimension Chart.

8.3.2 Fabrication

All assemblies with wood rail are fabricated with 3-1/2" x 3-1/2" x 3/16" tubular steel uprights.

8.3.3 Rail Attachment Angle

Fabricate 3-1/2" x 5" x 5/16" steel angle with four (4) 7/16" holes placed 1" from the edge of the 5" leg and 1-1/2" and 4-1/4" from the top and bottom of angle for attachment of wood rail (top and bottom). Countersink the hole on the outside face to receive 3/8" flathead bolt. For length of angle based on height of sign, refer to "Steel Angle Bracket" in the Double Post Assembly Dimension Chart. Weld angle to inboard side of post with top of angle flush to top of steel post, with angle mounted in same orientation on both uprights as shown in drawings. When assembled, each angle will face inboard but on opposite sides.

8.3.4 Blocking Attachment Holes

Four (4) 7/16" holes through both sides of fabricated post with angle attached as shown for attachment of outboard treated Douglas Fir blocking and inboard Western Red Cedar post cover.

8.3.5 Baseplate

5/8" holes in each corner of 7" x 7" x 1/2" baseplate as shown in the fabrication drawing, and 5/8" weep hole placed in the center of the baseplate. Baseplate welded to tubular steel post as specified. (See drawing 5.2-51-53)

8.4 Steel Post Fabrication for Double Post Signs with Steel Rail

8.4.1 Length

Length of interior tubular steel upright is determined by the height of the sign panel based on the size of the primary legend, 6", 9" and 12". Refer to "Steel Post Height" in the Double Post Assembly Dimension Chart.

8.4.2 Fabrication

Assemblies with steel rail are fabricated with 6" x 4" x 1/4", 8" x 6" x 1/4", and 8" x 6" x 5/16" tubular steel uprights. Size of post is based on size of sign panel and is specified under legend length reference in Double Post Assembly Dimension Chart.

8.4.3 Blocking Attachment Holes

Four (4) 7/16" holes through both sides of upright as shown for attachment of outboard treated Douglas Fir blocking, inboard treated Douglas Fir blocking (two part assembly), and inboard Western Red Cedar post cover.

8.4.4 Rail Attachment Holes

2 sets of 2 (4 total) 1" dia. holes on outboard side of upright, with 1/2" corresponding holes on inboard side of post as shown for attachment of rail from inside post. Staggered hole location must match orientation and alignment of receiving plate in end of steel rail precisely.

8.4.5 Baseplate

Specified anchor bolt holes in each corner as specified below and shown on drawings, with added weep hole in the center of the baseplate. Baseplate welded to tubular steel post as specified in drawings.

Post	Baseplate	Anchor Bolts	Baseplate Hole Size
6" x 4" x 1/4"	9" x 11" x 5/8"	5/8"	3/4"
8" x 6" x 1/4"	14" x 12" x 3/4"	3/4"	7/8"
8" x 6" x 5/16"	14" x 12" x 3/4"	3/4"	7/8"

8.5 Steel Rail Fabrication

8.5.1 Length

Length of interior tubular steel rail is determined by the width of sign. Based on the size of the primary legend, 4", 6", 9" and 12", refer to "Rail Length Steel" in the Double Post Assembly Dimension Chart.

8.5.2 Threaded Plug End Plate

Machined 1/2" x 5" x 5-5/8" end plates size is common for both 6' x 6" and 6' x 8" rails. Drill and tap two holes for 3/8"-16 bolts as dimensioned on the drawings. Alignment holes must match corresponding holes on upright precisely. Size of end plate and drilling tolerance for

hole location on both axis is (+/-) 5/1000 measured from center of the holes to the edge of the plate. Place 45 degree x 3/16" bevel (top and bottom) on 5" wide dimension for weld fill. Center end plate in tube and weld end plate into end of tubular rail section with faced of end plate flush to end of tube. Weld top and bottom and grind smooth.

8.5.3 Hex Bolt Attachment Holes

7/16" holes through face of rail for attachment of stainless 3/16"-16 threaded rod (7.25" for 6" and 9.25" for 8" deep rails) for custom machined hex head capture nut for panel attachment. Outboard holes are placed 7-1/2" from ends of rail. An additional hole is centered between the two outboard mounting holes if the sign panel is greater than 78", but not longer than 144". Holes are placed 4-1/2" from top of rail. Rails to carry panels longer than 144" to 240" will have two equally spaced (center to center) mounting holes between the outboard holes.

8.5.4 Interior Blocking Attachment Holes

25/64" holes in top of rail (top rail only) to receive Atlas Engineering, Bulletin AEK Spintite Rib-Wall Minimized-Profile Rivet. Location of holes to correspond precisely to factory drilled treated Douglas Fir interior blocking cap on rail. Cap alignment bolt assembly to be spaced staggered with maximum 36" (+/- 3" on center) with two attachment points on each end. End holes are located 6" from end of rail. All holes are placed 1-1/4" inboard from side of rail.

8.6 Steel Post Fabrication for Monolithic Sign

8.6.1 Length

All monolithic assemblies use same size 4" x 6" x 1/4" tubular steel section. Length of interior upright is determined by the height of the sign panel, based on the size of the primary legend, 4", 6", 9" and 12". Refer to "Steel Post Height" in the Monolith Assembly Dimension Chart.

8.6.2 Post Alignment Bracket Holes

6" long, 2" x 2" x 1/4" steel angle bracket with two (2) 5/16" holes placed 1" from the edge, and 1" from end of one face for attachment of 2" x 6" wood alignment cap blocking board. Weld angle to 6" face of tubular steel upright with drilled face placed flush to top. When assembled, each angle will face inboard, but on opposite sides. Center post to be oriented to receive factory-drilled alignment cap.

8.6.3 Outside Blocking Attachment Holes

25/64" dia. holes in outboard wall of steel upright to receive Atlas Engineering, Bulletin AEK Spintite Rib-Wall Minimized-Profile Rivet. Holes are placed in pairs, 1-1/2" from each side of tubular steel upright, and 3" from top and bottom of post. Intermediate holes are placed in pairs at a maximum 24" on center. Location of holes to correspond precisely to factory-drilled, pressure-treated 1-1/2" x 5" Douglas Fir outside blocking.

8.6.4 Hex Bolt Attachment Holes

7/16" holes through face of tubular steel upright for attachment of stainless 3/16"-16 x 7.25" threaded rod and custom machined hex head capture nut. Upper attachment hole is placed 3" from top of upright, centered in 4" wide face. Lower attachment point is placed precisely 12" less than the specified height of the sign panel.

8.6.5 Baseplate

3/4" hole in each corner of 8-1/2" x 9" x 3/16" baseplate as shown in the fabrication drawing, and 3/4" weep hole placed in the center of the baseplate. Weld baseplate as specified in drawing. Galvanized steel baseplates are to be primed and painted.

9

Sign Panel Fabrication

9.0 Introduction

This section covers sign panel fabrication specifications for all components used in the UniGuide Park Identity system.

9.1 Wood Sign Panel Scope

This includes 1-1/2" panels for double post signs, monolithic signs, and wall mounted signs. Hanging signs are 3" thick and are fabricated from two 1-1/2" panels.

9.2 Size of Panel

Size of each Identification Sign panel is based on sign format as determined using Park Identification and Facility Identification sign grids.

9.3 Adhesive

Application of phenolic resorcinol moisture resistant adhesive must be performed within 15 minutes between the first glue application and the final setting of the clamps. The surface of each joint face shall be completely covered with adhesive. Glued panels to cure for a minimum of 24 hours with clamps in place.

9.4 Air Temperature for Laminating Wood

Temperature shall be between 70–90 degrees Fahrenheit during drying of boards, glue application, and curing process. Boards to be stacked on drying racks and dried not less than 24 hours prior to gluing.

9.5 Panels

Construct using clear heart, kiln-dried vertical grain wood throughout, one board thick (1.5" finished) using 2" dimensional lumber (2" x 6", 2" x 8", and 2" x 10"). Panel size will be based on sign layout per specified grid formats.

9.6 Panel Assembly

Surfaces shall be edge-glued and planed smooth to 1-1/2" thick finish dimension. The end grain of laminated panel ends shall be face-glued with a 2" x 1-1/2" end strip, reinforced with 3", No.12 stainless steel Phillips flathead screws placed 8" center to center. Recess head 3/8" and fill with glued-in wood plugs. Following cutting and edging, all face and back edges shall be rounded to a radius of 1/8".

9.7 Graphics

For graphic application and finishing of sign panels see Graphic Layout and Production section of this specification.

9.8 Double-Post, Monolithic and Wall-Mounted Signs

9.8.1 Hardware

Hardware shall be a machined 2" x 4" x 3/16" aluminum keyhole receiving plate, to be attached to panel with four (4) No.10 x 1-1/4" stainless steel, flathead wood screws. Keyholes are precisely aligned to a corresponding oversize stainless steel hex bolt assembly mounted on the sign rail that is bolted through the frame or to an attachment plate on wall-mounted signs.

Each keyhole assembly is dadoed 3/16" deep into the back of the sign panel to be flush to the back of the sign. The keyhole plate is centered top and bottom, left and right to the center of the keyhole mounting bolt for each location.

To insert the head of the machined hex head mounting bolt behind the keyhole mounting plate, route 1-3/4" x 2-1/2" by 5/8" deep pocket behind the mounting plate. Top of dado to be 3/8" above center of bolt holding oversize hex bolt assembly.

9.8.2 Keyhole Plate Location

The number of keyhole plates for connection to the sign structure is based on the width of the panel. Exception includes F/PI-G monolithic panels with 12" legends; refer to the table below for number of keyhole plates required by width of panel.

<i>Panel Length</i>	<i>Quantity of Keyhole Attachments</i>
48" to 78"	2 top and 2 bottom (4 total)
78" to 144"	3 top and 3 bottom (6 total)
144" to 240"	4 top and 4 bottom (8 total)
144" to 180"	5 top and 5 bottom (10 total)
180" to 240"	6 top and 6 bottom (12 total)

The quantity of keyholes per assembly is not consistent for 6", 9" and 12" legend panels of the same length. Refer to respective charts on pages 5.2-75 to 5.2-78 for specifications. Note that the 5 and 6 post assemblies are use only with the 12" legends.

Each keyhole receiving plate is to be positioned vertically and horizontally off of the center point of the machined hex capture nut that is mounted on the sign rail, monolith upright or attachment plate. The upper bolt locations are six inches below the top of the sign panel

(+/- 1/16") on a horizontal, and five inches inboard from right and left sides. Additional keyhole plates as specified above will be centered equally between the center point of the two outside keyhole plates as measured from the center of the attachment bolt. The placement location of the lower row of keyhole plates is based on the height of the sign panel, and are placed precisely 12" less than the overall height of the panel as measured from the upper mounting location. For example, if the sign panel is 55.6", the bottom row of keyhole plates will be placed 43.6" below the upper row.

9.9 Hanging Panels

Hanging panels to be fabricated from two 1-1/2" panels glue attached back-to-back with phenolic resorcinol moisture resistant adhesive. Panels to be fabricated as described above. Prior to assembly, place two matching vertical 3/8"(d) x 3/4"(w) dadoed slots, one on each side of the panel for receipt of the 5/8" diameter eyebolt. Cut additional slot on both sides in location noted on drawing for insertion of oversized rectangular washer, but prepared so washer will fit tightly and not rotate when eye bolt is tightened. Oversized washers to be laminated into panel assembly on left and right side.

10

Wood Component Fabrication

10.0 Introduction

This section covers specifications for all wood components used in the UniGuide Park Identity system.

10.1 Wood Rail

10.1.1 Fabrication

Fabricate with No.1 select construction grade pressure-treated Douglas Fir, nominal 2" x 8" material for rail and 1/2" pressure-treated plywood for interior blocking. Length of rail assemblies to be 4-1/2" longer than finished panel width. Rails to be assembled from two continuous boards that are straight and without lateral twisting. Assemble joists with 7-1/4" x 12" x 1/2" thick plywood blocking on each end and 7-1/4" x 6" x 1/2" plywood blocking at each keyhole location. Place aluminum shim material at each blocking location as needed to create a 3-1/2" thick $\pm 1/32$ " rail assembly.

10.1.2 Drilling and Milling

Wood rail assemblies to be shop-drilled and milled for mounting holes, attachment to steel angle, and attachment of panel mounting hardware:

- Holes for rail attachment to steel angle: Drill two 7/16" dia. holes (top and bottom) through each end of rails, blocking and shim material. Holes to be 3-11/16" from end, and 1-1/2" from top and bottom of board. Counterbore, on opposing sides, 1-1/8" dia. x 1/2" deep holes on side without dado. Align holes and dado to corresponding location on welded angle post assembly (top of angle and joist assembly to be flush).
- Dado for rail attachment to steel angle: Place 5" wide x 5/16" deep dado for full height of the 2" x 8" (2 per rail assembly). Make 3/4" x 45° x full height of the (2" x 8") on same side as dado to clear inside corner of steel angle when attaching rail.
- Holes for keyhole hardware: 7/16" dia. through hole with 1-1/2" dia. x 3/16" deep counterbore on each end. Locate hole 7-1/8" from end of rail and 4-1/2" below top of rail for top assembly and 2-3/4" below top of rail for bottom rail. Place middle hole equally centered between outboard holes for all assemblies with panels over 78".
- Drill 3/32" pilot holes in top of rail to match hole location of finished 1-1/2" finished cedar cap.
- Factory assemble rail with 3/8" dia. bolt and hex head mounting hardware with intermediate 1/2" plywood blocking installed.

Drilling tolerance is (+/-) 1/16" with lengths measured top to bottom being within 1/16" overall.

10.2 Wood Blocking and Finished Post Covers and Caps

10.2.1 Wood Cap for Wood Rail

1-1/2" x 3-1/2" cap with length equal to width of sign panel. Material to be Western Red Cedar (or clear heart redwood). Pre-drill 3/16" attachment holes that are aligned with wood rail and placed 3/4" inboard from side and 5" from end with one screw placed on each side at approximately 24" on center. Use 3" galvanized deck screws, sand smooth and stain prior to attachment.

10.2.2 Finished Inboard Cedar Post Cover

Fabricate 1-1/2" x 3-1/2" panel with two 7/16" holes with 1" x 1/2" counterbore to accept washer and nut assembly. Material to be Western Red Cedar (or clear heart redwood). Holes must be in alignment with the companion holes in the steel upright used to secure the outboard blocking and this piece. Height of the inboard post cover is based on the height of the base of the sign panel above grade level. Refer to "Lower Inboard Block" in the Double Post Assembly Dimension Chart by size of legend (4", and 6" assemblies with wood rail).

10.2.3 Outboard Blocking for Steel Post Cover

Fabricate 1-1/2" x 3-1/2" blocking with four (4) 7/16" holes with 1" x 1/2" counterbore to accept washer and nut assembly. Material to be pressure-treated Douglas Fir. Holes must be in alignment with the companion holes in the steel upright used to secure the inboard cedar post cover and interior rail blocking. Height of the outboard blocking for steel post cover is based on the height of the overall sign. Refer to "Outboard Post Block" in the Double Post Assembly Dimension Chart by size of legend (4" and 6" assemblies with wood rail).

10.3 Double Post Sign with Steel Rail

10.3.1 Finished Wood Cap for Steel Rail

1-1/2" cap with length equal to width of sign panel. Width will be either 6" or 8" depending on size of tubular steel rail. Material to be Western Red Cedar (or clear heart redwood). Drill 1/2" diameter through holes with 1-1/8" diameter x 1/2" deep counterbore, two at each end and staggered every 16" on center (1-1/2" from edge of cap). Match holes in steel rail to connect with threaded inserts using 1" stainless steel (oversized OD) flat washer, beveled washer and 1/4"-20 machine screw. Sand smooth and stain prior to attachment.

10.3.2 Inboard Post Blocking for Steel Rail Assembly (2 part)

Two 1-1/2" thick blocks with two 7/16" holes to create 3" thick assembly. Width of block abutting steel tube will be either 6-1/2" or 8-1/2" depending on size of tubular steel rail. Width of second block will be either 6" or 8" depending on size of tubular steel rail and is drilled with 1" x 1/2" counterbore to accept washer and nut assembly. Material to be pressure-treated Douglas Fir.

Holes must align with the companion holes in the steel upright used to secure the outboard post blocking. Height of the inboard blocking is based on the height of the sign panel. Refer to “Upper Inboard Block” in the Double Post Assembly Dimension Chart by size of legend (6”, 9” and 12”).

10.3.3 Outboard Blocking for Steel Post Cover

1-1/2” blocking with four (4) 7/16” holes with 1” x 1/2” counterbore to accept washer and nut assembly. Material to be pressure-treated Douglas Fir. Width will be either 6-1/2” or 8-1/2” depending on size of tubular steel rail. Holes must align with the companion holes in the steel upright used to secure the inboard cedar post cover and interior rail blocking. Height of the outboard blocking for steel post cover is based on the height of the overall sign. Refer to “Outboard Post Block” in the Double Post Assembly Dimension Chart by size of legend (6”, 9” and 12”).

10.3.4 Finished Inboard Cedar Post Cover

1-1/2” panel with two (2) 7/16” holes with 1” x 1/2” counterbore to accept washer and nut assembly. Use 6-1/2” wide material on structures with 4” x 6” posts and 8-1/2” wide board for 6” x 8” steel posts. Material to be Western Red Cedar (or clear heart redwood). Holes must be in alignment with the companion holes in the steel upright used to secure the outboard blocking and this cover. Height of the inboard post cover is based on the height of the base of the sign panel above grade level. Refer to “Lower Inboard Block” in the Double Post Assembly Dimension Chart by size of legend (4”, 6”, 9” and 12”).

10.4 Double Post Assemblies: Fabricated Wood Post Cover and Cap

Finished glue-laminated post cover and cap is fabricated from Western Red Cedar (or clear heart redwood), 1-1/2” thick boards. Finished post face width and end width dimensions are based on legend size and structure size as specified in the chart on the next page.

Predrill 3/16” attachment holes in cover boards. Prefinish all surfaces except edges and backs to be glued in final assembly. Do not stain top end grain of post or underside of cap for gluing.

To assemble, screw wood post cover to interior blocking mounted to steel upright. Box section corners and cap to be glue-attached in the field with phenolic resorcinol adhesive and screws to create a closed box as shown in fabrication drawings. Embed screw head a minimum 1/4” below face of lumber when assembling. Butt lap joints to be flush (+/- 1/16”) top to bottom. Fill screw head locations smooth to face with two-part epoxy filler (Minwax or equal). Touch up stain after assembly in the field.

Legend Size	Post Size	Rail Width	Finished Face Width	Finished End Width	Top Cap Dimensions
4"	3-1/2" x 3-1/2"	3-1/2"	8"	6-3/4"	8" x 6-3/4"
6"	3-1/2" x 3-1/2"	3-1/2"	12"	6-3/4"	12" x 6-3/4"
6"	4" x 6"	6" (6" x 6")	11.25"	9-1/2"	11.25" x 9-1/2"
9"	4" x 6"	6" (6" x 6")	18"	9-1/2"	18" x 9-1/2"
9"	6" x 8"	8" (6" x 6")	18"	11-1/2"	18" x 11-1/2"
12"	4" x 6"	6" (6" x 6")	24"	9-1/2"	24" x 9-1/2"
6" x 8"	8" (6" x 6")	24"	11-1/2"	24" x 11-1/2"	12"

10.5 Monolithic Assemblies

10.5.1 Steel Post Alignment Board

1-1/2" x 6" pressure-treated Douglas Fir board. Length is 3" less than overall width of sign panel. Factory place one pair of 5/16" holes in each end with holes 6" from end and 1" inboard from side of board. Place additional holes in board for structures with one or more center posts. Note: location of center post holes will be 3" off center to center point because angle bracket is offset on side of post.

10.5.2 Outboard Blocking for Steel Post Cover

1-1/2" x 5-1/2" blocking with four (4) 7/16" holes with 1" x 1/2" counterbore to accept washer and nut assembly. Material to be pressure-treated Douglas Fir. Holes must align with the companion holes in the steel upright. Height of the outboard blocking for steel post cover is 3" less than height of the overall sign. Refer to "Outboard Frame Blocking" in the Monolithic Assembly Dimension Chart by size of legend (4", 6", 9" and 12").

10.5.3 Finished Cedar Top Cap

1-1/2" x 6" cap with length equal to width of sign panel. Material to be Western Red Cedar (or clear heart redwood). Attach with 2-1/4" galvanized deck screws. Predrill 3/16" pilot holes with two holes placed 4" from end and 1" inboard from side. Additional attachments are placed in pairs, 24" on center (+/- 4") along top of cap. Embed head of deck screw 1/4" and fill with two-part epoxy wood filler, and touch up stain to finish.

10.5.4 Outboard Cedar Finished End Panels

1-1/2" x 6" panels. Material to be Western Red Cedar (or clear heart redwood). Height of the outboard blocking for steel post cover is 1-1/2" less than height of the overall sign. Refer to "Outboard Post Cover" in the Monolithic Assembly Dimension Chart by size of legend (4", 6", 9" and 12"). Attach with 2-1/4" galvanized deck screws. Predrill 3/16" pilot holes with two holes placed 4" from top and bottom and 1" inboard from side. Additional attachments are

placed in pairs, 24" on center (+/- 4") along side of monolith. Embed head of deck screw 1/4" and fill with two-part epoxy wood filler, and touch up stain to finish.

10.5.5 Attachment of Hex Bolt in Rail

Affirm that keyhole plates correspond to bolts in frame. Panel keyholes capture an oversize stainless steel hex bolt assembly mounted on the sign rail or attachment plate for wall-mounted signs.

Bolt assembly to include two 1-1/8" diameter x 11/16" machined receiving nuts, one of which is welded to threaded rod. Drill specified number of 7/16" holes to receive panel mounting bolts. Bolt length will vary for double post signs: 4-1/2" for signs with wood rails (joists), 7-3/8" for signs with 6" x 6" steel rails, and 9-3/8" for signs with 8" x 6" steel rails.

10.6 Single Wood Post with Hanging Sign Panel

10.6.1 Post Size

Two sizes of the single post assemblies with hanging sign panel are specified based on size of primary identification legend and width of panel. These include a 36" wide panel with 3" primary legend, and a larger structure with a 48" wide panel and 4" primary legend.

Each structure, assembly, baseplate, and foot have been engineered based on the engineering criteria established for the UniGuide program. Nonstandard site conditions shall be engineered on a site-by-site basis.

10.6.2 Material

Fabricate solid (one piece) post using No. 1 Select Structural Grade Western Red Cedar. Material shall be well seasoned, free of any surface defects. Wood must be dry, with maximum moisture content not to exceed 12% during fabrication of assembly to maintain tolerances between component parts.

10.6.3 Alternate Material

If specified by ordering park, single wood post assembly can be fabricated from Douglas Fir No. 1, Select Structural Grade material. This structure would be painted in lieu of stain with paint of the same color as the sign leg specification. The sign panel will follow the standard specifications for Western Red Cedar or clear heart redwood.

10.6.4 Upright Lumber Dimensions

Finished dimension of upright post and cross member are provided in the chart below.

<i>Legend Size</i>	<i>Panel Width</i>	<i>Post Size</i>	<i>Cross Member</i>
3"	36"	9-1/2 x 9-1/2" x 13'-0"	7-1/2" x 7-1/2" x 5'-5"
4"	48"	11-1/2 x 11-1/2" x 15'-0"	9-1/2" x 9-1/2" x 6'-10"

10.6.5 Chamfer Post and Cross Member

Place 45 degree x 3/4" chamfer on post edges, top of post, edge and end of cross brace, and matching fascia boards. Taper ends at top of post, and on cross member and fascia boards, leaving 1-3/4" without chamfer as shown on drawings.

10.6.6 Finish

Sand finish upright and cross member assembly and factory finish as specified in this section. Insert cedar end plugs into counterbored attachment holes once assembly is complete and paint to match assembly.

- Western Red Cedar assemblies to be stained as specified.
- Douglas Fir assemblies to be painted with enamels of the same specified colors.

10.7 Post Fabrication**10.7.1 Length of Post**

Cedar post to be precisely cut to length specified.

10.7.2 Drilling for Baseplate Attachment, Cross Member, Support Bracket, and Panel Bolts

Place holes through post for cross member attachment as specified on drawings. Measure drill locations from the bottom of the post. Drilling tolerance between holes is (+/-) 1/16". All holes drilled through the timber sections to have common location on both sides of finished post.

10.7.3 Attachment of Baseplate Straps

11/16" dia. holes in side of post for 5/8"-11 through bolts (3 each side). Measure from bottom of post for location of mounting holes. Subtract 1/4" from measurement location on baseplate to yield 1/4" space under post in mounted finished assembly (3" on face for base plate straps will be 2-3/4" from base of post for first mounting hole on post, and opposing side will be 8-3/4" from bottom of post for first mounting hole on post).

10.7.4 Tenon Attachment

9/16" holes with 1-1/2" x 1-1/4" counterbore for 1/2"-13 through bolt. Note: Drill 9/16" hole with finished, fabricated tenon inserted to assure correct bolt alignment in final assembly.

10.7.5 Support Bracket Attachment

11/16" holes for 5/8"-11 bolt to retain steel bracket at top of post, with 2" dia. x 2" deep counterhole on back face for washer and nut.

10.7.6 Panel Attachment

11/16" holes for 5/8"-11 J-bolt to suspend sign panel and retain steel bracket on cross member.

10.7.7 Machine Dado for Baseplate Mounting Straps

Machine 1/2" deep dado at bottom of post on all four sides for inserting mounting straps. Top of dado to extend 2" beyond top of baseplate strap and be feathered out to front face of post to create smooth inset sleeve for inserting shims should they be required with shrinkage to post in the future. Dado size for 9-1/2" post is 1/2" x 3-1/2" x 36", and 1/2" x 4" x 42" for 11-1/2" post.

10.7.8 Cut Mortise

Machine mortise into upright post. Sidewalls and top of mortise to be true and straight. Corners to be sharp with radius no greater than 1/16". Mortise to be vertically centered on post at location specified in fabrication drawing.

- Mortise for 9-1/2" post to be 7-1/2" tall by 4-1/2" wide
- Mortise for 11-1/2" post to be 9-1/2" tall by 6-1/2" wide

10.7.9 Cross Brace Fabrication

Machine tenon for inserting in upright post. Size of tenon to match fabrication drawings precisely. Tenon to be 21-1/2" x long x 4-1/2" wide for 7-1/2" square cross brace and 25-1/2" long x 6-1/2" wide for 9-1/2" square cross brace.

10.7.10 Fascia Boards

Cut and chamfer as specified. Drill four (pilot holes in fascia board for attachment to tenon.

10.7.11 Steel Bracket

Form 1/2" x 4" steel bracket with 11/16" mounting holes as shown in drawings. Precise length to be determined in fabrication process. Finished bracket to be hot-dipped galvanized and painted black with one coat of metal primer and two of coats finished alkyd enamel.

10.7.12 Assembly Hardware

All assembly hardware are standard products and are listed with product numbers for ordering from McMaster-Carr Supply Company should they not be available locally. McMaster-Carr provides any type of delivery required for production, including next day service.

11

Steel Component Fabrication

11.0 Introduction

This section covers fabrication specifications for all steel components used in the UniGuide Park Identity system.

11.1 Steel Baseplates for Single Post Hanging Sign (Galvanized and Painted)

Baseplates are specified based on size of timber and mounting height of sign. These include:

- 36" wide panel for 3" primary legend for 9-1/2" x 9-1/2" x 13'-0" post, with 14" x 14" x 5/8" baseplate and 3-1/2" x 1/2" x 36" mounting straps
- 48" wide panel for 4" primary legend for 11-1/2" x 11-1/2" x 15'-0" post, with 16" x 16" x 5/8" baseplate and 4" x 1/2" x 42" mounting straps
- 0.625" steel plate (A-36) for welded baseplates, and 0.5" x 3-1/2" and
- 0.5" x 4" steel flat stock (A-36) for welded straps for baseplates

11.2 Fabrication

11.2.1 Side Straps

Fabricate steel flat stock to specified length. Place two 11/16" dia. holes in each piece at locations noted on drawing. Note that hole on front face is lower than the side strap to stagger the six mounting bolts on the post

11.2.2 Baseplate

Machine baseplates with four 3/4" dia. holes at locations specified on each respective drawing.

11.2.3 Welding

Weld side straps to baseplate with full penetration weld on both sides. Straps to be attached precisely as noted in drawing (+/- 10/1000). Finished straps to be aligned 90 degrees to the baseplate surface.

11.2.4 Finishing

Remove all sharp edges or machine burrs. Remove weld slag and machine oil. Sandblast baseplate assembly with copper slag abrasive to create even finish over all surfaces.

11.2.5 Galvanized Finish

All fabricated steel baseplate assemblies for hanging signs shall be hot-dip galvanized after fabrication.

11.3 Metal Preparation and Paint Coating for Steel Baseplates

11.3.1 Painting

Galvanized steel baseplates are to be primed and painted.

11.3.2 Reference

Matthews Paint Company (1800-323-6593) 8201 100th Street, Pleasant Prairie, WI 53158

11.3.3 VOC Alternate

Matthews MAP-VOC (low volatile organic compound acrylic polyurethane) is available for use where VOC compliance is required.

11.3.4 Metal Preparation

All surfaces to be coated should be free of oil, grease, soil, weld slag, weld splatter, or other contaminant. Surfaces to be dry before application of primer. Tack wipe or remove sandblast residue or dust prior to applying pretreatment and priming.

11.3.5 Metal Pretreatment

Apply Matthews Acid Activated PT Filler (74760/74766) to provide superior bonding of primer and finish coat to clean bare metal. Mix with specified activator and apply per manufacturer's specifications to 0.5 to 0.75 mils dry film thickness. Primer can be applied after 30 minutes, or when tack free.

11.3.6 Primer

Matthews Rust Inhibiting White Epoxy Primer (274908) with Matthews Activator (274909) and Reducer (285900) to be mixed with specified hardener and applied per manufacturer's specifications to 1.5 to 3 mils dry film thickness (3 to 6 mils wet film thickness).

Finish Coat: Spray apply two coats Matthews Acrylic Polyurethane (MAP) enamel, satin gloss finish (number 26A-1A) mixed with MAP Catalyst and appropriate reducers depending on temperature and humidity per manufacturer's specifications. Finish coat to be 1.5 to 2 mils dry film thickness (3 to 4 mils wet film thickness). Finish coat can be applied over Rust Inhibiting White Epoxy Primer within 30 to 60 minutes, or when dry to the touch. If finish coat is applied over 48 hours after primer application, surface should be lightly broken with 400 grit sandpaper for proper adhesion.

11.3.7 Field Touch-up

Matthews Acrylic Polyurethane can be brush or roller applied. For good workability and finished surface quality use Matthews Brushing/Rolling Additive (number 47-444SP). Color tolerance for match shall be 1 unit or less CMC.

11.3.8 Packaging for shipping

Painted baseplates must be fully protected prior to shipping to eliminate scratches or other surface abrasion in transit.

12

Aluminum Component Fabrication

12.0 Introduction

This section covers fabrication specifications for all aluminum components used in the UniGuide Park Identity system.

12.1 Aluminum Plate for Wall-Mounted Signs

Two assemblies per sign installation

12.2 Material

1/4" x 3" Aluminum. 6061-T6 flat plate material that is free of sharp edges of or other surface imperfections

12.3 Length of Plate

Aluminum to be 2 inches shorter than overall panel width.

12.4 Fabrication

Two types of hole are to be placed in plate. These include holes for wall mounting bolts and holes for attachment of machined hex head mounting bolt.

12.4.1 Wall Mounting Bolts

Place 7/16" holes 1-1/2" from each end of plate and place additional holes approximately 12" on center between the two outside mounting holes. Local conditions may require moving mounting bolt holes to align with appropriate attachment media.

12.4.2 Hex Bolt Mount

Place 7/16" holes 4" from each end of plate. If panel is longer than 78", place a third panel equal distant from the two outside hex bolt mounting locations.

Countersink hole on back side to receive 3/8"-16 hex head bolt. Location of mounting bolts shall correspond precisely to keyhole receiving plates in sign panel.

12.4.3 Assembly

Attach custom Machined Hex Head Mounting Nuts with intermediate flat washer. Factory package 3/8-16 threaded rod with jam nuts and flat washers. Do not assemble until the selected mounting holes are identified. Mount aluminum plate with at least 3 connection points, top and bottom. Hole selection will be dictated by local conditions.

13

Porcelain NPS Arrowhead Production

13.0 introduction

This section contains only size and production specifications for laser cut and fabricated porcelain enamel NPS Arrowhead logos for application to routed cedar and redwood sign panels.

Specific requirements of this application are for 16 gauge panel, plasma cut NPS Arrowhead logo shape with threaded steel mounting studs on back of panel, and with 2-color porcelain enamel finish.

13.1 Production

16 gauge enameling steel to be cut using dry cutting from outline artwork as provided. Cut edges to be sanded and files to eliminate any burrs or sharp edges. Stud weld threaded rod to back of panel based on layout drawings provided. Base coat and base PMS-Warm Grey No. 2 color to cover face, edges, and back completely (back is not a finished side). Screen-print NPS Arrowhead graphic on panel (no bleed).

13.2 Mounting Studs

Weld threaded mounting studs (1 to 6 depending on size of Arrowhead) to back of panel based on specific location shown on layered artwork files. Studs for Arrowheads mounted to sign panels to be 1/4"-20 x 1-3/8" unless otherwise specified. Studs for Arrowheads mounted to masonry structures to be 1/4"-20 x 1" unless otherwise specified.

13.3 Relief Mounting on Masonry Structures

Large-scale NPS Arrowhead logos placed on masonry structures will be mounted to 1" thick, King StarBoard marine grade polymer sheet. Color: seafoam. Polymer sheet to be cut to match silhouette of porcelain enamel Arrowhead logo. Drill attachment holes for mounting studs into polymer sheet with 1/2" dia. x 3/8" deep counterbore in back of panel to receive mounting washer and nut. Place additional 3/8" x 4" mounting bolts from front of polymer sheet for embedment into masonry surface. Refer to stud anchorage specifications for wall-mounted signs for installation of 3/8" bolts in surface.

13.4 Artwork & Size

NPS Arrowhead logo will be provided as an Adobe Illustrator file in each of the sizes noted below. Files will be identified by Arrowhead size (W x H). Each file will be digitally layered to include outline of Arrowhead logo for cutting, location of studs for mounting and artwork for screen-printed image. The finished size of each Arrowhead logo is identified in the table on the next page by application.

C Ground-Mounted Park Identification with Arrowhead on Panel (1)

<i>Legend size</i>	<i>Height relative to "x"</i>	<i>Arrowhead size (W x H)</i>
4"	1.7x height	5.4" x 6.8"
6"	1.7x height	8.2" x 10.2"
9"	1.7x height	12.2" x 15.3"
12"	1.7x height	16.3" x 20.4"

D Ground-Mounted Park Identification with Arrowhead on Masonry Column (1)

<i>Legend size</i>	<i>Height relative to "x"</i>	<i>Arrowhead size (W x H)</i>
4"	3.5x height	11.2" x 14"
6"	3.5x height	16.8" x 21"
9"	3.5x height	25.2" x 31.5"
12"	3.5x height	33.6" x 42"

E Hanging Park Identification with Arrowhead on Panel (1)

<i>Legend size</i>	<i>Height relative to "x"</i>	<i>Arrowhead size (W x H)</i>
3"	1.7x height	4.1" x 5.1"
4"	1.7x height	5.4" x 6.8"
6"	1.7x height	8.2" x 10.2"

F Hanging Park Identification with Arrowhead on Masonry Column (1)

<i>Legend size</i>	<i>Height relative to "x"</i>	<i>Arrowhead size (W x H)</i>
4"	4.5x height	16" x 20"
6"	4.5x height	24" x 30"

(1) Size based on legend size primary legend height ("x")

14

Graphic Layout and Production

14.0 Introduction

Graphic layout shall be as shown on attached drawings. Graphics to be accurately reproduced from plotted outline template or directly from computer to router based on full size digital vector art provided. Allowable reproduction tolerance is (+/-) 0.0625" for typographic reproduction of all letters less than 10 cm and (+/-) 0.125" for typographic reproduction of all letters greater than 10 cm. An accurate grid shall be used to insure layout is properly aligned vertically and horizontally on panel.

Letters shall be horizontally aligned to a tolerance of (+/-) 0.125" from side of panel to left edge of legend with standard adjustments for round or overhanging letters. Inter-letter spacing shall be horizontally aligned to a tolerance of (+/-) 0.0625" from letter to letter and (+/-) 0.5" overall based on the typographic specifications in this document.

Letters shall be horizontally aligned to a tolerance of (+/-) 0.125" from top of panel to baseline of legend, or from baseline to baseline of multi-line legends. Optical adjustment for overhang of round letters will be maintained as provided in the digital files.

14.1 Grid Format

All graphics to be formatted using UniGuide Graphic Standards as specified in Chapter 2 of this manual. This includes type size, typefaces, use of NPS Arrowhead logo, kerning, margins (left and right), top alignment, and overall panel proportions.

14.2 Typography

Legends to be NPS Rawlinson Heavy with +50 kerning in Adobe Illustrator for primary park identification legend and Frutiger Bold with +50 kerning for National Park Service/U.S. Department of the Interior identifier and for secondary identification name. All legends are displayed with mixed case with initial capital letters only and lowercase for remainder of word. All sign legends are to be prepared using the typographic specifications provided in Chapter 2: UniGuide Graphic Standards.

14.3 NPS Arrowhead Logo

For panels receiving NPS Arrowhead logo, machine route 1/8" deep area into overbar section of panel. Silhouette of panel to be oversized by 1/8" for even attachment. Oversized artwork for computer-driven router will be incorporated into vector art files for sign production.

Place 3/16" dia. attachment holes for threaded studs mounted in the back of the porcelain enamel Arrowhead logo. Hole location is different for each size Arrowhead graphic size.

14.4 Route Overbar Dado

Route 1/4" deep dado line between the overbar and main sign panel. Width of dado to be 0.0833 of primary legend height (.25" for 3", 0.333" for 4", .5" for 6", .75" for 9", and 1" for 12" capital letter). Dado to be placed within the field of the primary legend panel, with the NPS overbar being the full height as noted in the layout grid format. Overbar dado to be finished same color as overbar.

14.5 Routing Quality

NPS Rawlinson Bold park identification is Machine-routed unless otherwise specified using a 30 degree "V" route bit with 1/8" flat sidewall inset. Routed graphics must conform exactly to the same size artwork. Routing depth to be a uniform except where such depth would distort very small forms. Corners of typography less than 3" cap height shall have a radius no greater than 0.0625". Typography of 3" and larger shall have radii no greater than 0.125". All burrs on edges will be removed by sanding with the grain of the wood.

14.6 Frutiger Bold Legends

Machine-routed unless otherwise specified using a vertical-sided flat-bottom bit. Routed graphics must conform exactly to the same size artwork. Routing depth to be a uniform 0.375", except where such depth would distort very small forms. Corners of typography less than 3" cap height shall have a radius no greater than 0.0625". Typography of 3" and larger shall have radii no greater than 0.125". All burrs on edges will be removed by sanding with the grain of the wood.

15

Stain, Paint, and Finishing

15.0 Introduction

This section covers proper stain, paint, and finishing procedures and specifications for components used in the UniGuide Park Identity system.

15.1 General Requirements

15.1.1 Paint Room Facilities

Well-ventilated, dust-free and enclosed. Air temperature shall not be less than 65 degrees Fahrenheit during application of stain and paint.

15.1.2 Letter Fill

After panels are routed, apply two coats of alkyd primer to routed letters. Once thoroughly dry and clean, apply finish coat of exterior latex enamel to routed letterforms and shapes, and stain or paint panels and structures.

15.1.3 Panel and Structure Finishing

All surfaces to be painted must be clean and thoroughly dry. All Douglas Fir structures must be dry and free of pitch to assure full adhesion of paint.

15.1.4 Finished Sanding

After finish coats of letter-fill enamel have been applied and thoroughly dried, panel to be machine drum sanded, removing up to 0.0625" of sign surface. No planing, use of hand-held belt, orbital, or vibrating sander shall be permitted, and all sawdust and sanding residue shall be removed from the sign.

15.2 Routed Letter Fill

15.2.1 Routed Letters Primer

Wood Primer: Benjamin Moore Fast Drying Exterior alkyd (oil base) primer, No. 09400 or approved equal.

15.2.2 Routed Letters Paint

Paint shall be Off White (2B-2143-50 Old Prairie), custom-mixed exterior grade gloss Benjamin Moore Impervex enamel (No. 309-2B), or approved equal. To prevent bleeding on the face of the panel, DO NOT use thinner to remove residual paint, but wipe dry with cloth. Remaining surface liquid shall be removed with the final sanding of the sign face.

15.3 Stain Finishing: Sign Panel, Overbar, and Post**15.3.1 Application**

Apply three coats with brush or roller to all exposed surfaces of sign panel and posts. DO NOT stain areas to receive paint or areas already painted. Remove excess stain by wiping with dry cloth. Stain shall be thoroughly mixed prior to and during application to ensure even pigmentation. Panels will be rack-dried a minimum of 24 hours and completely dry to the touch prior to shipping.

15.3.4 Stain

For exterior surfaces of sign panels and posts, use Benjamin Moore brand solid color and semi-transparent stains, or approved equal.

15.3.5 Primer

Wood Primer: Benjamin Moore, Exterior Fast Drying Exterior alkyd primer, No. 09400 or equal.

15.3.6 Sign Panel Overbar

Solid color stain: Benjamin Moore Acrylic Latex Solid Stain (No. 089 4B),
Color: River Rock-2139-10

15.3.7 Sign Panel, Cap and Ends of Monolith

Solid color stain: Benjamin Moore Acrylic Latex Solid Stain (No. 089-4B),
Color: Grey-Brown-5/E 1000

15.3.8 Sign Uprights, and Sign Post for Single Post Assembly

Solid color stain: Benjamin Moore Acrylic Latex Solid Stain (No. 089-4B),
Color: Dark Brown-2130-10

15.4 Enamel Finishing: Sign Panel, Overbar, and Posts**15.4.1 Application**

Douglas Fir uprights and panels may be finished with exterior grade Benjamin Moore brand enamel in lieu of solid color stain. All surfaces to be primed with alkyd primer specified, and finished with the enamel paints specified below.

15.4.2 Primer

Wood Primer: Benjamin Moore, Exterior Fast Drying Exterior alkyd primer, No. 09400 or equal. All surfaces to be primed with alkyd primer prior to enamel application.

15.4.3 Enamel

For exterior surfaces of sign panels and posts, use Benjamin Moore brand enamel in lieu of solid color stain.

15.4.4 Sign Panel Overbar

Benjamin Moore Acrylic Moorglo Enamel (No. 096-4B),
Color: River Rock-2139-10

15.4.5 Sign Panel, Cap and Ends of Monolith

Benjamin Moore Acrylic Moorglo Enamel (No.096-4B),
Color: Grey-Brown-5/E 1000

15.4.6 Sign Uprights and Sign Post for Single Post Assembly

Benjamin Moore Acrylic Moorglo Enamel (No.096-4B), Color: Dark Brown-2130-10

15.5 Pre-assembly of Components

All complete sign panel and post assemblies must be predrilled and assembled in the factory prior to shipment to check alignment of all parts and attachment holes and to insure proper fit once installed, if level. Panels manufactured as separate units shall be predrilled with hardware inserted in place.